

83347

S/139/60/000/004/003/033

E032/E514

Application of the Perfect Differential Method to the Solution of Quantum Mechanical Problems

given by
$$F(k, x) = c \exp \left\{ \int_{x_0}^x u(k, \xi) d\xi + \int_{k_0}^k \hat{\Lambda}(u) \Big|_{x=x_0} dk \right\}, \quad (7)$$

where c , x_0 and k_0 are constants and $u = \partial F / \partial x$ is the solution of the nonlinear differential equation

$$\frac{\partial u}{\partial k} - \frac{\partial}{\partial x} \left[\hat{\Lambda}(u) \right] = 0. \quad (8) \quad \checkmark$$

The present paper is concerned with a modification of this method so that it can be used to solve the following wave equation:

$$\hat{L} \psi(x) = \frac{d^2 \psi}{dx^2} + \left[\epsilon - v(x) \right] \psi = 0. \quad (9)$$

It is required to determine the values of the parameter ϵ for which there are solutions satisfying either $\psi(|x| \rightarrow \infty) \rightarrow 0$ or a cyclic condition. If the above method of solution is used in this

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case, then the left-hand side of Eq.(9) will be equal to zero provided the limits of integration k_1 and k_2 are determined from Eq.(6), i.e. Eq.(2) will be a solution of Eq.(9) for any value of ϵ . On the other hand, the method must be modified if it is required to determine the proper functions and the corresponding values of the parameter ϵ . The solution of Eq.(9) is sought in the form of

$$\psi(x) = \int a(k) e^{F(k,x)} dk \quad (10)$$

and the appropriate conditions for the integration limits k_1 and k_2 are obtained. The method is illustrated with the example of the wave equation for a free particle and the linear harmonic oscillator. In this modified form the method involves the solution of

$$\frac{\partial u}{\partial k} - \frac{\partial^2 u}{\partial x^2} - 2u \frac{\partial u}{\partial x} + \frac{\partial v}{\partial x} = 0, \quad (40)$$

rather than Eq.(9). There are 2 Soviet references.

ASSOCIATION: Ural'skiy gosudarstvennyy universitet imeni A.M. Gor'kogo (Ural State University imeni A.M. Gor'kiy)

SUBMITTED: July 6, 1959

Card 4/4

S/126/61/011/002/001/025
E032/E314

AUTHORS: Masharov, S. I. and Rezanov, A. I.

TITLE: Electrical Resistance and Defect Formation Energy

PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol. 11,
No. 2, pp. 181 - 185

TEXT: It is stated that there is a discrepancy between theory and experiment when the effect of lattice defects on the electrical properties of metals is taken into account. The present authors describe an attempt to obtain a better agreement. A relation is established between the resistance due to defects and the energy necessary for the formation of these defects. The discussion begins with a consideration of the metal at a sufficiently low temperature for all effects associated with thermal motion to be ignored. In the initial state (metal without defects), the system of nuclei at rest is characterised by a uniform spatial distribution with a density ρ_0 . The system of electrons is also spatially homogeneous and their distribution over the various states

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EO32/E314

Electrical Resistance

is described by a function $f_0(v)$, e.g. the Fermi function.
The internal field is assumed to be absent ($E_0 = 0$). When
the defects are present the spatial distribution of the nuclei
is described by a given function $\rho(r)$, which is such that

$$\rho(r) = \rho_0 + \rho_1(r) \quad (1)$$

where $\rho_1(r)$ are subject to the following limitations

$$\rho_1(r) \ll \rho_0; \quad (2)$$

$$\rho_1(r) \rightarrow 0; \quad |r| \rightarrow \infty; \quad (3)$$

$$\int \rho_1(r) (dr) = 0. \quad (4)$$

The system of electrons in the metal with defects is
described by a distribution function $f(r, v)$, which
satisfies the equations

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$$(\mathbf{v} \nabla_r) f + \frac{e}{m} (\mathbf{E} \nabla_v) f = 0; \quad (6)$$

$$\text{div } \mathbf{E} = 4\pi e \left\{ Z\rho(r) - \int f(r, \mathbf{v}) (d\mathbf{v}) \right\}. \quad (7)$$

Bearing in mind Eq. (2), the function f can be found by the method of successive approximations, using the expansion

$$f(r, \mathbf{v}) = f_0(\mathbf{v}) + f_1(r, \mathbf{v}) + f_2(r, \mathbf{v}) + \dots \quad (8)$$

It can then be shown from Eqs. (6) and (7) that

$$f_1(r, \mathbf{v}) = Zu(v) \int \frac{\rho_0(q)}{q^2 + q_0^2} \exp(i\mathbf{q}\mathbf{r}) (d\mathbf{q}), \quad (11)$$

where

$$u(v) = \frac{4\pi e^2}{m} \frac{1}{v} f'_0; \quad q_0^2 = \int a(v) (d\mathbf{v}). \quad (12)$$

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and $\varphi_1(q)$ is the Fourier amplitude of the function $\varphi_1(r)$.
The potential of the internal field $\varphi_1(r)$ can be shown to
be given by:

$$\varphi_1(r) = 4\pi eZ \int \frac{\varphi_1(q)}{q^2 + q_0^2} \exp(iqr) (dq). \quad (13)$$

For evaluating this potential it turned out to be possible
to abandon the usual assumption that the presence of defects
has no effect on the form of the potential functions of
isolated atoms. Under this assumption, φ_1 is found from:

$$\varphi_1(r) = \sum_n V(r - R_n - \delta R_n) - \sum_n V(r - R_n), \quad (14)$$

where R_n is the radius vector of the n-th ion in the ideal
lattice.

δR_n is the displacement vector for the n-th ion

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and V is the potential function for the ion, i.e. for the nucleus and the surrounding electronic cloud. V is usually chosen to be in the form of a spherically symmetric Coulomb potential. However, this assumption cannot be justified in the case of ions in the neighbourhood of vacancies, interstitial atoms, etc. or in the neighbourhood of dislocations, where the electronic clouds are subjected to an asymmetric effect due to their neighbours. Calculation of $\phi_1(r)$ on the basis of Eq. (14) leads to a formula analogous to Eq. (13), except that q_0 is replaced by the screening constant q_{scr} . The difference ($q_0 \neq q_{scr}$ in general) is apparently due to the fact that changes in the electronic density are not taken into account in Eq. (14). Finally, the solution for f_2 can be found from Eqs. (6) and (7) and is

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$$f_s(r, v) = Z^2 b(v) \int \frac{(q^2 + Q^2(v)) \rho_1(q') \rho_1(q - q') \exp(iqr)}{(q^2 + q_0^2) (q'^2 + q_0^2) [(q - q')^2 + q_0^2]} (dq) (dq'), \quad (17)$$

$$b(v) = \frac{4\pi e^2}{m} \frac{1}{v} a'(v); \quad Q^2(v) = q_0^2 - \frac{a(v)}{b(v)} \int b(v) (dv). \quad (18)$$

This theory is then used to compute the electrical resistance associated with the scattering of the conduction electrons on the defects. This is given by

$$R = \frac{mv_z}{e^2 n} \ell^{-1} \quad (19)$$

where v_z is the velocity corresponding to the limiting Fermi energy, n is the number of conduction electrons per unit of volume and ℓ is the mean free path for interactions

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with the defects. Experimental results for the residual resistance and the resistance of plastically deformed metals have not supplied any evidence for the existence of anisotropy in R . It may therefore be considered that the Fourier amplitude of the potential depends only on $|q|$. Under this assumption, the mean free path is given by

$$\Gamma^{-1} = 16\pi^3 \left(\frac{dK}{dE} \right)_c K_c^2 \int_0^\pi B(K, K') (1 - \cos \theta) \sin \theta d\theta. \quad (20)$$

where

$$\begin{aligned} B(K, K') &= |(K' | e\varphi_1 | K)|^2 = \left| \int \exp[i(K - K')r] e\varphi_1(r) (dr) \right|^2 = \\ &= (4\pi e^2 Z)^2 \frac{|p_1(x)|^2}{x^2 + q_0^2}; \quad x = K' - K; \\ x^2 &= 2K^2(1 - \cos \theta); \quad |K'| = |K|. \end{aligned} \quad (21)$$

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Thus, the resistance R is found to be proportional to

$$F(\kappa) = \frac{|\epsilon_1(\kappa)|^2}{\kappa^2 + q_0^2} \quad (22) .$$

The defect-formation energy can be written down as the difference between the internal energy of the system with and without the defects

$$W = \int \left\{ \frac{m}{2} \int v^2 f(dv) + \frac{E^2}{8\pi} - \frac{m}{2} \int v^2 f_0(dv) \right\} (dr). \quad (23) .$$

Substituting $f = f_0 + f_1 + f_2$ and $E = E_1 = -\nabla \phi_1$, i.e. computing W up to second-order terms, one finds that

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EO32/E314

$$W = 2\pi e^2 Z^2 \int \frac{q^2 + Q_0^2}{(q^2 + q_0^2)^2} |p_1(q)|^2 (dq). \quad (24)$$

where

$$Q_0^2 = \frac{m}{e^2} \left\{ \int_0^{\tilde{v}} v^4 b(v) dv - \frac{p_0^2}{q_0^2} \int_0^{\tilde{v}} v^4 a(v) dv \right\}; \quad p_0^2 = \frac{4\pi e^2}{m} \int \frac{1}{v} a'(v) dv. \quad (25)$$

In computing W , use is made of the condition $p_1(q)_{q=0} = 0$ which follows from Eq. (4). It follows from Eq. (24) that the function F in Eq. (22), which enters into the formula for R , can be written down in the form:

$$F(q) = \frac{|p_1(q)|^2}{q^2 + q_0^2} = \frac{W}{2\pi e^2 Z^2} \chi(q). \quad (26)$$

where the unknown function $\chi(q)$ satisfies the condition:

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$$4\pi \int_0^\infty q^2 \frac{q^2 + Q_0^2}{q^4 + q_0^2} \chi(q) dq = 1 \quad (27)$$

Using the substitution

$$\beta(K) = \int_0^\pi \chi(K \cos \theta) (1 - \cos \theta) \sin \theta d\theta, \quad (28)$$

and Eqs. (19), (20), (21) and (26), the final expression for R is found to be

$$R = (16\pi^2)^{-1} \frac{m v_c}{2n} \left(\frac{dK}{dE} \right) K^2 \beta(K) W. \quad (29)$$

Acknowledgments are expressed to I.S. Zyryanov for valuable advice. There are 9 references: 5 Soviet and 4 non-Soviet.

Card 10/11

Electrical Resistance 10/125/61/011/002/001/025
LC52/E314

ASSOCIATION: Ural skiy gosudarstvennyy universitet im.
A.M. Gor'kogo (Ural State University im.
A.M. Gor'kiy)

SUBMITTED: June 20 1960

Card 11/11

REZANOV, A.I.; MASHAROV, S.I.

Theory of the heat capacity of weak substitutional solid solutions
at low temperatures. Fiz.met.i metalloved. 13 no.1:3-9 Ja '62.
(MIRA 15:3)

1. Ural'skiy gosudarstvennyy universitet imeni A.M.Gor'kogo.
(Solutions, Solid--Thermal properties)
(Metals at low temperature)

MASHAROV, S.I.

Effect of the addition of small concentrations on the electrical
resistance of metals. Fiz. met. i metalloved. 13 no.2:156-172
F '62. (MIRA 15:3)

1. Ural'skiy gosudarstvennyy universitet im. A.M.Gor'kogo.
(Metals--Electric properties) (Crystal lattices)

MASHAROV, S.I.

Electric conductivity of metals having vacancies. Pis. met. i metalloved.
14 no.2:288-290 Ag '62. (MIRA 15:12)

1. Ural'skiy gosudarstvennyy universitet imeni A.M.Gor'kogo.
(Crystal lattices) (Metals—Electric properties)

MASHAROV, S.I.

Frequency spectrum of acoustic vibrations of crystals with vacancies. Izv. vys. ucheb. zav.; fiz. no.5:39-42 '63. (MIRA 16:12)

1. Ural'skiy gosudarstvennyy universitet imeni A.M.Gor'kogo.

MASHAROV, S.I.

Frequency spectrum of elastic waves in ordered binary alloys. Fiz. met.
i metalloved. 17 no.2:176-183 F '64. (MIRA 17:2)

1. Ural'skiy gosudarstvennyy universitet imeni Gor'kogo.

MASHAROV, S.I.

Electric resistance of disordered alloys. Fiz. met. i metalloved.
19 no.6:820-826 Je '65. (MIRA 18:7)

1. Ural'skiy gosudarstvennyy universitet imeni Gor'kogo.

MASHAROV, S.I.

Heat resistance of unordered binary alloys. Fiz. met. i
metalloved. 20 no.4:489-493 0 '65.

(MIRA 18:11)

1. Ural'skiy gosudarstvennyy universitet imeni A.M.
Gor'kogo.

ACC NR: AR6031876

SOURCE CODE: UR/0058/66/000/006/E041/E041

AUTHOR: Masharov, S. I.

TITLE: The heat capacity of ordered alloys 1

SOURCE: Ref. zh. Fizika, Abs. 6E320

REF SOURCE: Uch. zap. Ural'skogo un-ta. Ser. fiz., vyp. 1, 1965, 145-151

TOPIC TAGS: heat capacity, binary alloy, alloy, Debye temperature, disordered alloy, ordered alloy

ABSTRACT: The possibility of making theoretical evaluations of the lattice position of the heat capacity C_v with the volume of binary alloys constant is discussed. At low temperatures, $C_v = \text{constant} \cdot (T/\theta)^3$, where θ is interpreted as the Debye temperature of the alloy. In the case of completely disordered solid solutions with components having close atomic masses, the value θ is a weighted mean of the Debye temperatures of each component in a hypothetical power field, corresponding to the power field of the alloy. In general, this magnitude depends not only on concentrations, but also on the atomic masses of components and on the extent of the long-range order. In the high-temperature

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ACC No. AR6031876

range, the lattice heat capacity is expressed through moments of frequencies of the phonon spectrum, while the latter in turn, are related to the Debye temperature. K. Gurov. [Translation of abstract]

SUB CODE: 20/

Card 2/2

MASHAROVA, L.G.

Biogeochemical provinces with calcium and phosphorus deficiency
in Novosibirsk Province. Trudy Biogeokhim. lab. no.11:189-196 '60.
(MIRA 14:5)

1. Sibirskiy nauchno-issledovatel'skiy institut zhivotnovodstva.
(NOVOSIBIRSK PROVINCE--FEEDS--ANALYSIS)
(CALCIUM--PHYSIOLOGICAL EFFECT)
(PHOSPHORUS--PHYSIOLOGICAL EFFECT)

MASHAROVA, N.V., instn. PZ-1111, 5.1.1. 1941; Tondalid, 1.1.1. 1941.
KISLOV, 1.1.1. 1941.

Investigating the performance of the fan unit of the unit
designed by engineers A.A. and B.V. Kuznetsov. 1941.
KuzNEI no. 101.00-1.1.1. 1941. 1941. 1941.

PHASE I BOOK EXPLOITATION

SOV/6392

Brezhneva, K. M., T. S. Masharova, I. F. Nikolayevskiy, D. I.
Smetanina, S. V. Supov, T. I. Fishbeyn, and A. B. Khotimskiy

Tranzistory i poluprovodnikovyye diody (Transistor and Semiconductor
Diodes) Moscow, Svyaz'izdat, 1963. 646 p. Errata slip inserted.
40,000 copies printed.

Ed. (Title page): I. F. Nikolayevskiy; Ed.: L. I. Vengrenyuk;
Tech. Ed.: K. G. Markoch.

PURPOSE: This handbook is intended for technicians and scientists
concerned with the application of semiconductor devices. It
may also be useful to students of radio engineering divisions
in schools of higher education and to advanced radio amateurs.

COVERAGE: This is the second edition of the handbook and it differs
from the first by giving more complete information, including data

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Transistor and Semiconductor Diodes

SOV/6392

concerning new transistors and diodes. It also introduces a new general chapter on transistors in which the physical meaning and significance of each parameter are explained in detail and lists the specific characteristics of the transistors commonly used in the USSR. No personalities are mentioned. There are no references.

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MASHARSKIY, B. N.

USSR/ Engineering - Test instruments

Card 1/1 **Pub. 128 - 18/34**

Authors : Valnev, D. P.; Il'ina, R. N.; Masharskiy, B. N.; and Rhinskiy, P. D.

Title : The ultrasound defectoscopy of forged pieces

Periodical : Vest. mash. 12, 63-64, Dec 1954

Abstract : The operation, structure and adaptability of the UZD-9 defectoscope used for detecting and recording cracks and deformations in forged pieces was investigated. Drawings.

Institution :

Submitted :

MASHARSKIY

NOVIKOV, A.K.; KOLESNIKOV, A.Ye.; MASHARSKIY, B.N.

Calibrating vibrometers used for measuring vibrations of
mechanisms. Izv. tekhn. no. 2: 32-35 Mr-Apr '58. (MIRA 11:3)
(Vibration--Measurement)
(Calibration)

MALINUSHKIN, B.F.; MASHARSKIY, I.M.

Modern systems for the molding of paper and paperboard. ~~Bpm.~~
prom. 38 no.1:15-16 Ja '63. (MIRA 16:2)

1. Gosudarstvennyy institut po proyektirovaniyu predpriyatiy
tsellyuloznoy i bumazhnoy promyshlennosti.
(Papermaking machinery)

GELLER, V.M.; MASHARSKIY, Ye.I.; SENDERZON, M.E.

Formation of a single-band signal for telemetering. Izv. Sib.
otd. AN SSSR no. 11:134-136 '62. (MIRA 17:9)

1. Novosibirskiy elektrotekhnicheskiy institut.

ACC NR: AR6035216 SOURCE CODE: UR/0274/66/000/008/A078/A078

AUTHOR: Krivoguzov, A. S.; Mikhaylov, P. A.; Masharskiy, Ye. I.

TITLE: Frequency meter

SOURCE: Ref. zh. Radiotekhnika i elektrosvyaz', Abs. 8A577

REF SOURCE: Tr. Novosib. elektrotekhn. in-t svyazi, vyp. 1, 1965, 90-100

TOPIC TAGS: frequency meter, frequency band, frequency measurement, frequency spectrum

ABSTRACT: A device has been developed for frequency measurement with an accuracy of $\pm 1 \cdot 10^{-6}$ in the 3—10 Mc frequency band. It is based on producing spectra of frequencies multiple of the frequency of a basic quartz-crystal oscillator of 100 kc. The measured frequency is read using a decade scaler. A block diagram of the system, the basic circuits of the essential junctions and the results of experimental tests are presented. A number of advantages of this device as compared to the PICH-3 precision frequency meter are mentioned. [Translation of abstract] [NT]

SUB CODE: 17/

Card 1/1

UDC: 621.317.76:621.317.36

11/15/11/7/11
KURAYEV, A.V.; SEMENOV, P.L.; BILYI, N.G.; BULAVA, V.P.; VYAZ'MIN, V.A.;
GOMUBEV, B.S.; DYSHMAN, B.M.; KARLIN, B.S.; KATUKOV, G.I., KUGEL',
N.V.; NASHATIN, V.I.; RAGUSEKAYA, L.F.; RUBINSHTEIN, S.M.; SUTRANOV,
A.B.; TARASOV, L.A.; FEDOROVA, A.A.; FEDOROV, L.N.; TSEPKIN, N.P.;
SHAYNICH, A.G.; VASIL'YENVA, I.A., red. isd-va; TIKHANOV, A.Ya.,
tekhn. red.

[ZIL-158 and ZIL-158A motorbuses; instructions for operation] Avtobusy
ZIL-158 i ZIL-158A; instruktsiia po ekspluatatsii. Moskva, Gos.
nauchno-tekhn. isd-vo mashinostroit. lit-ry, 1958. 193 p.
(MIRA 11:7)

1. Moskovskiy avtomobil'nyy zavod.
(Motorbuses)

ARMAND, G.B.; VYAZ'MIN, V.A.; GRINSHTEYN, L.M.; GOL'DBERG, G.I.; GOLUBEV,
B.S.; KASHLAKOV, M.V.; KRASNOPEVTSKY, M.P.; KUZNETSOV, S.I.;
KURAYEV, A.V.; KAYUKOV, G.I.; MASHATIN, V.I.; MOLOTILOV, V.I.;
MERUSH, A.R.; PRAL', G.I.; RAGUSKAYA, L.F.; RUBINSHTEYN, S.M.;
SEMENKOV, P.L.; TARASOV, L.A.; FEDOROVA, A.A.; TSEPKIN, M.F.;
SHAYEVICH, A.G.; ZARUBIN, A.G., otv.red.; VASIL'YEVA, I.A., red.
izd-va; SOKOLOVA, T.F., tekhn.red.

[ZIL-157 motortruck; operation and service] Avtomobil' ZIL-157;
instruktsiia po ekspluatatsii. Gos.nauchno-tekhn.izd-vo mashino-
stroit.lit-ry, 1958. 235 p. (MIRA 11:12)

1. Moskovskiy avtomobil'nyy zavod.
(Motortrucks)

MASHAYEV, F.F., dotsent, kand.ekonom.nauk

On the problem of applying the economic laws of socialism to the supervision of the national economy by the Communist Party and the Soviet state. Trudy Ural. politekh. inst. no.95:5-24 '59.

(MIRA 13:8)

(Russia--Economic policy)

GORLOVSKIY, M.A. [deceased], red.; GOTLOBER, V.M., red.; YELOKHNOV, P.I.,
red.; MASHAYEV, F.F., red.

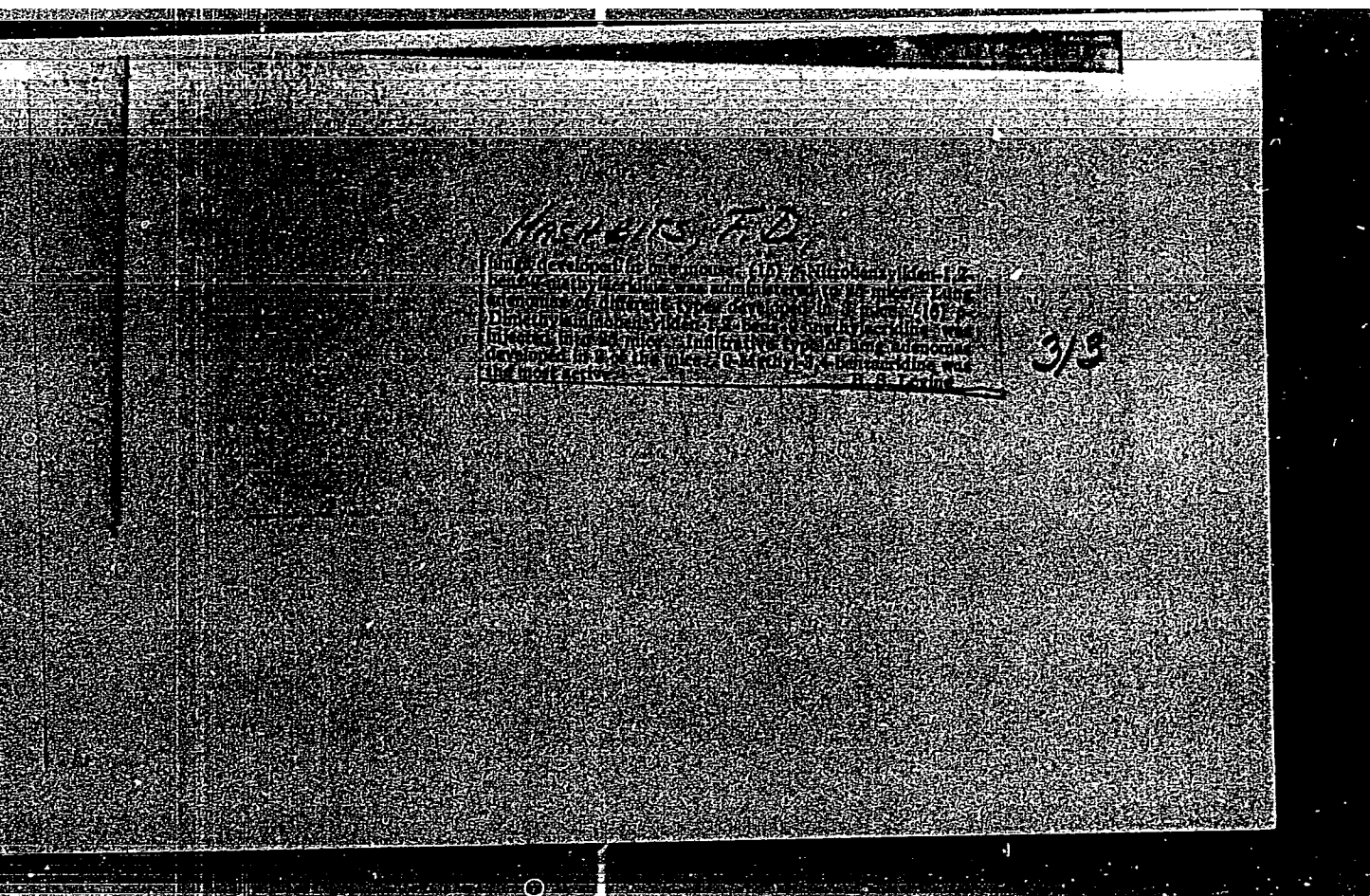
[Problems of economic history and economic geography]
Voprosy ekonomicheskoi istorii i ekonomicheskoi geografii:
sbornik statei. Sverdlovsk, Sredne-Ural'skoe kn. zhnoe izd-vo,
1964. 277 p. (MIRA 18.11)

1. Sverdlovsk. Ural'skiy gosudarstvennyy universitet.

MASHBITS, F.D.

USSR:

The effect of low protein diet on the growth of transplanted tumors. A. P. Belova and P. D. Mashbits. *Trudy Akad. Nauk SSSR*, 1964, No. 20021. A tumor M1 was transplanted to the livers of guinea pigs 70-85 g. body wt. kept on a low-protein diet. The growth of the tumor was depressed under such conditions. When the low-protein diet was changed to a diet containing 18.3% protein, the growth of the transplanted tumor proceeded on the same level as in a normal diet. E. W. Schell.



MASHBITS, F. D.

FD-2266

USSR/Medicine - Oncology

Card 1/1 Pub 17-17/20

Author : Gel'shteyn, V. I.; Mashbits, F. D.

Title : Investigation of blastomogenic properties of certain cholestadienes

Periodical : Byul. eksp. biol. i med. 3, 66-69, Mar 1955

Abstract : Investigated the blastomogenic properties of six different cholestadienes ($\Delta^{2,4}$ -cholestadiene, $\Delta^{4,6}$ -cholestadiene, $\Delta^{3,5}$ -cholestadiene, $\Delta^{4,6}$ - $\Delta^{2,4}$ -dicholestadienyl, $\Delta^{3,5}$ -cholestadiene -- 3-methyl- $\Delta^{3,5}$ -cholestadiene, and 3-ethyl- $\Delta^{3,5}$ -cholestadiene) by subcutaneous injection in mice and subsequent histological examination on the natural death of the mice. Table. One reference, USSR, since 1940.

Institution: Laboratory of Experimental Oncology (Head-Prof. L. M. Shabad, Corresponding Member of the Academy of Medical Sciences USSR) of the Institute of Oncology (Director-Prof. A. I. Serebrov, Corresponding Member of the Academy of Medical Sciences USSR) of the Academy of Medical Sciences USSR

Submitted : June 26, 1954 by N. N. Petrov, Member of the Academy of Medical Sciences USSR

PHASE I BOOK EXPLOITATION

(1)
SOV/5245

Ministerstvo svyazi SSSR. Tekhnicheskoye upravleniye

Novyye razrabotki v oblasti radiosvyazi i radioveshchaniya; informatsionnyy sbornik (New Developments in the Field of Radio Communication and Radio Broadcasting; Informational Collection) Moscow, Svyaz'izdat, 1959. 80 p. 11,500 copies printed. (Series: Tekhnika svyazi)

Resp. Ed.: A. S. Vladimirov; Ed.: V. I. Bashur; Tech. Ed.: G. I. Shefer.

PURPOSE: This collection of articles is intended for technical personnel concerned with the development and operation of radio communication and radio broadcasting.

COVERAGE: The book contains, according to the Foreword, information on new developments realized at the Gosudarstvennyy nauchno-issledovatel'skiy institut Ministerstva svyazi SSSR (State

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New Developments in the Field (Cont.)

Scientific Research Institute of the Ministry of Communication USSR). Radio communication and radio broadcasting apparatus are described. Several articles are concerned with the development of new checking and measuring instruments. No personalities are mentioned. There are no references.

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New Developments in the Field (Cont.)

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- Bobrov, A. I. Generator of GS-R-60-Type Signals With Calibrated Output Level 59
- Rabinovich, G. I. Heterodyne Wave Meter 65
- Fomin, M. V. Installation for Calibrating Superhigh-Frequency Attenuators 69
- Gurevich, M. S., V. Ye. Belovitskiy, and N. V. Deryugin. Electronic Copying Device for Reproducing Electric Pulses of Arbitrary Shape From a Drawing 75

AVAILABLE: Library of Congress: (TK6563.R92)

JP/dfk/ec
6-15-61

Card 3/3

MASHBITS, L. M.
CA

PROCESSES AND PROPERTIES INDEX

Influence of a low-protein diet on the vitamin C content in the organs of white rats and on the urinary excretion.
S. Kaplanshil and L. Mashbits. *Biokhimiya* 12, 201-7 (1947). - It was observed that vitamin C was rapidly destroyed in the bodies of patients on a low-protein diet. When white rats were fed a low-protein diet, less than the normal amt. of vitamin C was excreted in the urine. The liver and kidneys of such rats contained only 60-65% of the normal vitamin C content; the adrenals and intestines contained 50%; and the spleen 90%. The vitamin C content of the organs did not increase after the rats, which had been fed a low-protein diet, were given 10 mg. of vitamin C daily. A low-protein diet leads to the destruction of both endogenous and exogenous vitamin C.
11. Priority

Lab Tissue Chem., Inst Biol + Med Chem., AMS USSR
and Clin Biochem., 2nd Moscow Med Inst.

ASB 114 METALLURGICAL LITERATURE CLASSIFICATION

1000 1100 1110 1120 1130 1140 1150 1160 1170 1180 1190 1200 1210 1220 1230 1240 1250 1260 1270 1280 1290 1300 1310 1320 1330 1340 1350 1360 1370 1380 1390 1400 1410 1420 1430 1440 1450 1460 1470 1480 1490 1500 1510 1520 1530 1540 1550 1560 1570 1580 1590 1600 1610 1620 1630 1640 1650 1660 1670 1680 1690 1700 1710 1720 1730 1740 1750 1760 1770 1780 1790 1800 1810 1820 1830 1840 1850 1860 1870 1880 1890 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990 2000 2010 2020 2030 2040 2050 2060 2070 2080 2090 2100 2110 2120 2130 2140 2150 2160 2170 2180 2190 2200 2210 2220 2230 2240 2250 2260 2270 2280 2290 2300 2310 2320 2330 2340 2350 2360 2370 2380 2390 2400 2410 2420 2430 2440 2450 2460 2470 2480 2490 2500 2510 2520 2530 2540 2550 2560 2570 2580 2590 2600 2610 2620 2630 2640 2650 2660 2670 2680 2690 2700 2710 2720 2730 2740 2750 2760 2770 2780 2790 2800 2810 2820 2830 2840 2850 2860 2870 2880 2890 2900 2910 2920 2930 2940 2950 2960 2970 2980 2990 3000 3010 3020 3030 3040 3050 3060 3070 3080 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MASHBITS, L.M.; FRIDLYAND, I.B.

Ascorbic acid concentration in organs and its excretion with urine
in guinea pigs infected by *Bacillus perfringens*. Vop.med.khim.
3:253-256 '51. (MIRA 11:4)

1. Kafedra biokhimii II-go Moskovskogo meditsinskogo instituta imeni
I.V. Stalina.
(ASCORBIC ACID) (*CLOSTRIDIUM PERFRINGENS*)

MASHBITS, L.M.; GUR'YEVA, I.P.

Restoring the synthesis of ascorbic acid and the antianemic principle
in white rats kept on a protein-low diet. Vop.med.khim. 4:168-179
'52. (MIRA 11:4)

1. Kafedra biokhimii II Moskovskogo meditsinskogo instituta imeni
I.V.Stalina.
(ASCORBIC ACID) (PROTEIN METABOLISM) (ANEMIA)

MASHBITS, L. M.

TELEGRAPHY

'Experimental Verification of the Effectiveness of Reception of Telegraph Signals with Pre-Detector Integration' by L. M. Mashbits.
Elektronosv'yz, No 12, December 1957, pp 22-29.

Discussion of the principles of realization of pre-detector integration of telegraph signals and description of a block diagram and a circuit schematic for the integrating circuitry. A procedure used for the investigations and the results of comparative tests of systems with post-detector and pre-detector integration are given. Reference is made to an article by H. L. Doelz "Predicted-Wave Radio Teleprinter", Electronics, No 12, 1954.

Card: 1/1

- 1 -

MASHBITS, L. M.

L. M. Mashbits, "On the influence of feeder parameters on the noise coefficient and the sensitivity of a receiver system." Scientific Session Devoted to "Radio Day", May 1958, Trudrezervizdat, Moscow, 9 Sep 58.

A derivation is given of the formula for the noise coefficient of a feeder operating from an antenna with the radiation resistance $R_A = W$ and the relative temperature t_A .

It is proved that the feeder noise coefficient is independent of the matching coefficient of the feeder to the receiver input.

An expression is determined for the noise coefficient of the reception system. Expressions relating the receiver input parameters, the input matching coefficient, the feeder parameters, the relative antenna temperature and the receiver sensitivity for given values of the signal-to-noise ratio and a given receiver pass band.

A conclusion is drawn that it is expedient to try to have the magnitude of input matching coefficient be an optimum, independently of the feeder length, when designing and adjusting receivers in the frequency band used by USW mainline radio communications.

A block diagram and a method of determining the relative antenna temperature under conditions of a real communication line is presented.

83655

S/100/60/000/000/000/000
B012/B007

6.9400

AUTHOR:

Mashits, L. M.

TITLE:

On the Effect of Feeder Parameters on the Noise Factor
and the Sensitivity of the Receiving System

PERIODICAL:

Radiotekhnika. 1960, Vol. 15, No. 1, pp. 38-47

TEXT: The present analysis begins with a determination of the noise factor of the feeder on the basis of the equivalent circuit shown in Fig. 1. Formula (15) for the noise factor N_{af} of the feeder is deduced (a antenna, f - feeder). It shows that N_{af} is independent of the input and output mismatching factors, and that it is only determined by the parameters β (feeder-damping per unit length) and l (geometrical feeder length) as well as by t_A (t_A is a dimensionless coefficient indicating to what degree the temperature of a resistor which is equal to the input resistor R_a of the antenna, must be higher than the temperature T of the surrounding medium, so that the noise developed by this resistor is

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S/108/60/C.9/001/005/006
B012/B067

On the Effect of Feeder Parameters on the Noise Factor and the Sensitivity of the Receiving System

equal to that of the antenna). If $t_A = 1$, (15) passes into formula (14). For calculating a real communication line (consisting of receiver, antenna and feeder) the influence of all elements belonging to this system and/or their parameters must be considered. For this purpose the concept of the noise factor N_{afr} of the receiving system is introduced and defined by formula (18) (a - antenna, f - feeder, r - receiver). The block diagram of a receiving system with a receiver, a feeder, and an antenna is shown in Fig. 3. Formulas (22), (24), and (25) are deduced. They show that the optimum value of the matching factor K_{opt} for the receiver input war-ranting the N-minimum (N - noise factor of the receiver) is the optimum value also for the N_{afr} (noise factor of the entire system (Fig. 3)).

This is due to the fact that this value is independent of t_A , β and l . It is pointed out that in contrast to N , which characterizes only the receiver, the noise factor N_{afr} characterizes not only the equipment (antenna, feeder, receiver) but also the reception conditions at the line concerned. For the calculation it is more convenient to use directly the

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On the Effect of Feeder Parameters on the Noise Factor and the Sensitivity of the Receiving System

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B012/B007

formula for the sensitivity of the reception system instead of that for N_{afr} . This formula (33) is deduced here and diagrammatically shown for various N and t_A in Figs. 4, 5 and 6. The values of the noise factor N corresponding to the matching of the output power maximum ($K_1 = 1$) (K_1 - matching factor at the input) or of the noise factor minimum ($K_1 = K_{1 \text{ opt}}$) for different h_1 (input noise factor) and α ($\alpha = R_R/R_E$, R_R - tube parameter characterizing the anode circuit noise, R_E input resistor) are then inserted into formula (33). The curves obtained are shown in Figs. 7, 8, and 9. They show the increase in sensitivity of the receiving system on the transition from $K_1 = 0$ to $K_1 = K_{1 \text{ opt}}$ under the various operational conditions of the reception system (it and N_{afr} and various h_1 and α values. Finally, the method of determining the relative noise temperature t_A of the antenna is given. t_A can be determined experimentally. Here, the considerations upon which the experimental

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On the Effect of Feeder Parameters on the Noise
Factor and the Sensitivity of the Receiving
System

83655

S/105/60/015/001/005/001
B012/B067

determination is based are described, and formula (39) for t_A is derived.
 t_A can be determined therefrom or from the diagram shown in Fig. 1.
There are 10 figures and 6 Soviet references.

SECRETED: September 4, 1966

Card 4/4

SERPUKHOVITIN, D.V.; MASHBITS, M.G.

Method for identifying Trichomonas in vaginal secretion. Lab. delo
7 no.10:31-33 0 '614 (MIRA 14:10)
(TRICHOMONAS) (VAGINA--DISEASES)

MASHBITS, Ya.O.

"Chile." A.A.Dolinin. Reviewed by I.A.O.Mashbits. Geog.v shkole
no.2:74-75 Mr-Ap '54. (MIRA 7:2)
(Dolinin, A.A.) (Chile)

MASHBITS, Ya.

Economics of capitalist countries after the second world war.
Geog. v shkole no.4:79 JI-Ag '54. (MLRA 7:8)
(Economics)

MASHBITS, Ya. G.

"Geography of hunger" [abridged translation from the English].
Josue de Castro. Reviewed by I.A.G. Mashbits. Geog. v shkole
18 no.2:76-79 Mr-Apr '55. (MLBA 8:7)
(Geography, Economic) (De Castro, Josue.)

MASHBITS, Ya.; KULAGIN, G.; TIKHOMIROV, V.P., otvetstvennyy redaktor;
CHIZHOV, M.N., redaktor; NOGINA, N.I., tekhnicheskiy redaktor

[Spain, Portugal, Andorra, Gibraltar] Ispania, Portugaliia,
Andorra, Gibraltar. Moskva, Gos. izd-vo geogr. lit-ry. 1956. 23 p.
(Iberian Peninsula) (MLRA 9:9)

ARMAYS, Francisco; MASHBITS, Yakov; LAVRENT'YEVA, Ye.V., redaktor;
KOSHELEVA, S.N., ~~tekhnicheskii~~ redaktor

[Spain] Ispania. Moskva, Gos. izd-vo geogr. lit-ry, 1956. 76 p.
(Spain--Geography) (MLRA 10:1)

MASHBITS, Ya.G.

"Bibliography of the geography of Mexico" [in Spanish]. A.Bassels.
Reviewed by IA. G.Mashbits. Izv.AN SSSR.Ser.geog.no.4:140-141
Jl-Ag '56. (MLRA 9:10)

1.Institut geografii Akademii nauk SSSR.
(Mexico--Geography) (Bassels, A.)

MASHBITS, Ya.G.; GOKHMAN, V.M.; KUMKES, S.N.; TIKHOMIROV, V.P., otvetstvennyy
red.; ASOYAN, N.S., red.; VILENSKAYA, N.N., tekhn. red.

[Mexico, Guatemala, Honduras, British Honduras, Salvador, Nicaragua,
Costa Rica, Panama] Meksika, Gvatemala, Gonduras, Britanskiy Gondu-
ras, Sal'vador, Nikaragua, Kosta-Rika, Panama. Moskva, Gos. izd-vo
geogr. lit-ry, 1958. 53 p. (MIRA 11:7)
(Central America) (Mexico)

MASHBITS, Ya G.

NIKOL'SKAYA, V.V

3(5)

FRANK I BOOK EXPLOITATION

SOV/1796

Moskovskoye obshchestvo issytleley prirody. Geograficheskaya sektsiya.

Regional'noye karstovedeniye; trudy soveshchaniya po regional'nomu karstovedeniyu (Regional Study of Karst Phenomena; Papers of the Meeting on the Regional Study of Karst Phenomena) Moscow, 1958. 79 p. 600 copies printed.

Additional Sponsoring Agency: Moskovskoye obshchestvo issytleley prirody. Redaktsionno-izdatel'skiy sovets.

Ed.: (Title page): N.A. Gvondetskiy, Professor; Ed. (Inside book): G.N. Rudel'man

PURPOSE: This book is intended for geologists, hydrologists, specialists in engineering geology, and speleologists.

COVERAGE: This collection of articles is based mainly on reports presented at a Conference on Regional Studies of Karst organized by the Geographical Section of the Moscow Society of Naturalists

Card 1/3

Sakulov, B.S. Certain Characteristics in the Development of Karst in One of the Regions of the Middle Course of the Y. Yrtse River (China)

61

Gvondetskiy, N.A., and Ya. G. Mashbits. Some Problems of the Tuzetian Karst (Geomorphology, Water Supply and Settlements)

71

AVAILABLE: Library of Congress (G5C1.M5)

Card 1/3

RM/1eb

MASHBITS, Ya.G.

Latin American geographical literature. Vop.geog. no. 44:
240-249 '58. (MIRA 12:5)
(Latin America--Geography)

MASHBITS, Ya.G.

Reference series published by the U.S. Department of Commerce.
Vop.geog. no. 44:264-265 '58. (MIRA 12:5)
(Geography, Economic)

SOV/99-59-2-9/12

30(1)

AUTHOR: Mashbits, Ya.G.

TITLE: The Irrigation and Economy of Mexico (Orosheniye
zemel' i ekonomika Meksiki)

PERIODICAL: Gidrotekhnika i melioratsiya, 1959, Nr 2, pp 50-53
(USSR)

ABSTRACT: The article deals with the irrigation and economy of
Mexico. There are 4 tables.

Card 1/1

MASHBITS, Ya.G.

Visit of the Cuban geographer, Professor Antonio Munoz Jimenez, to
the Institute of Geography of the U.S.S.R. Academy of Sciences.
Izv. AN SSSR. Ser. geog. no.5:159-160 8-0 '60. (MIRA 13:10)
(Munoz Jimenez, Antonio) (Russia--Relations (General) with Cuba)
(Cuba--Relations (General) with Russia)

MASHBITS, Ya.G.

Mexican geographer's visit to the Institute of Geography of the
U.S.S.R. Academy of Sciences. Izv. AN SSSR. Ser. geog. no.6:142-143
E-D '60. (MIRA 13:10)
(Bassols Batalla, Angel) (Mexico--Geography)

MASHBITS, Yakov Grigor'yevich; GOKHMAN, V.M., otv. red.;
LAVRENT'YEVA, Ye.V., red.; SHAPOVALOVA, N.S., mladshiy red.;
KISELEVA, Z.A., red. kart; BURLAKA, N.P., tekhn. red.

[Mexico; economic and geographical features] Meksika;
ekonomiko-geograficheskaya kharakteristika. Moskva, Gos.
izd-vo geogr. lit-ry, 1961. 296 p. (MIRA 15:3)
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L 10241-66 EWT(d)/FBD/EWT(1)/EEC(k)-2/EPF(n)-2/T/EWP(k)/EWA(m)-2/EWA(h) SCTB/LJP(c)

ACC NR: AP5028275 WG/WW/AT

SOURCE CODE: UR/0020/65/165/002/0303/03G4

AUTHOR: ^{55 44} Kurbatov, L. N.; ^{55 44} Kabanov, A. N.; ^{55 44} Sigriyanskiy, V. V.; ^{55 44} Mashchenko, V. Ye.;
^{55 44} Mochalkin, N. N.; ^{55 44} Sharin, A. I.; ^{55 44} Soroko-Novitskiy, N. V. 9/91

ORG: none

TITLE: Generation of coherent radiation in GaAs samples excited by electrons

SOURCE: AN SSSR. Doklady, v. 165, no. 2, 1965, 303-304

TOPIC TAGS: laser, semiconductor laser, ^{25, 44} electron beam, ^{21, 44, 55} gallium arsenide, crystal lattice, electron

ABSTRACT: Laser action at 77K and at room temperature is reported in both n- and p-type GaAs excited with a beam of electrons. The Fabry-Perot cavity was prepared by cleaving in the (110) plane. The resonator mirror surfaces were separated by a distance of 50—60 μ . An electron beam device supplied electrons with energies up to 60 kev. The repetition rate and the pulse duration were 50—200 pulses per second and 9×10^{-8} sec, respectively. The maximum beam current at a beam diameter of 60—70 μ was 17 mamp. The electron beam was normal to the polished surface of the sample. The light was emitted from the faces normal to the polished faces. The threshold current densities were different for different samples and varied between 70 and 150 amp/cm². Since the effective mass of the electron and the width of the forbidden gap in GaAs are larger than in InSb and InAs (two of the other semiconductor lasers) and the lifetime of the electrons is very short, population inversion in

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UDC: 537.311.33

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GaAs should occur at a temperature of the electron gas equal to the Debye temperature ($\theta_D = 410K$) and not the lattice temperature. Therefore, in the range of lattice temperatures between 77—300K, the threshold current should depend weakly on the temperature. The weak temperature dependence of the threshold current for laser action in GaAs was confirmed experimentally. Orig. art. has: 2 figures. [CS]

SUB CODE: 30 / SUBM DATE: 14Jan65/ ORIG REF: 003/ OTH REF: 004/ ATD PRESS:

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